Q. Code: 678586

Reg. No. | | | | | | | | | | | | | |

B.E / B.TECH. DEGREE EXAMINATIONS, MAY 2023

Fifth Semester

EC18009 – MEDICAL ELECTRONICS

(Electronics & Communication Engineering)

(Regulation 2018)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Illustrate and explain various bio-potential measuring instruments	**3**
CO 2	Distinguish and categorize bio chemical and Non electrical parameter measurements	**3**
CO 3	Identify and differentiate various assist devices	**3**
CO 4	Illustrate and explain the operation of therapeutic and telemetric devices.	**3**
CO 5	Identify and explain the operation of advanced diagnostic devices.	**3**

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Define action potential.	**1**	**1**
2.	Sketch the typical ECG waveform with proper time intervals.	**1**	**1**
3.	Define –Cardiac Output. Find the CO of a person if his heart rate is 70BPM and stroke volume is 70ml.	**2**	**3**
4.	What are systolic and diastolic pressures?	**2**	**2**
5.	List out the importance of orthotics in human assist devices.	**3**	**2**
6.	Elucidate the function of hearing aids.	**3**	**1**
7.	Compare Micro shock with Macro shock.	**4**	**3**
8.	What does the term fulguration in diathermy refer to ?	**4**	**2**
9.	What is a radio-pill? List its components.	**5**	**2**
10.	What are the advantages of performing surgery using LASER?	**5**	**2**

PART- B (5 x 14 = 70 Marks)

		Marks	CO	RBT LEVEL
11.(a)	Elucidate on different EEG waves. Draw a typical 8 channel EEG recording setup and discuss its function.	**(14)**	**1**	**3**
	(OR)			
(b)	**(i)** Justify the need for Instrumentation amplifier in the biomedical equipment.	**(7)**	**1**	**3**

	(ii)	List the different types of Isolation amplifiers and explain any one with neat sketch.	**(7)**		
12.(a)		Describe in detail the principle of Auto analyzer with neat diagram and elaborate on each part of it.	**(14)**	**2**	**3**
		(OR)			
(b)	**(i)**	Explain the principle of operation of Electro magnetic blood flow meter.	**(7)**	**2**	**3**
	(ii)	Any one blood cell counter.	**(7)**		
13.(a)		Explain the heart lung machine with neat block diagram and discuss about the different types of Oxygenators.	**(14)**	**3**	**3**
		(OR)			
(b)		What is the need for pace makers? Construct a ventricular programmed pacemaker for a 'R' wave inhibited condition.	**(14)**	**3**	**3**
14.(a)		Draw and explain the block diagram of Surgical diathermy unit and explain its various modes.	**(14)**	**4**	**3**
		(OR)			
(b)		Discuss in detail how the Ground fault interrupters may be employed to reduce the risk of electrical shocks.	**(14)**	**4**	**3**
15.(a)		What are the components of biotelemetry system? Briefly discuss about the single channel ECG telemetry system.	**(14)**	**5**	**3**
		(OR)			
(b)		Construct and explain a Magnetic resonance imaging system with no ionizing radiation to infer the cerebral and spinal cord anatomy.	**(14)**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	**CO**	**RBT LEVEL**
16.	Using Einthoven triangle, demonstrate the bipolar lead systems adapted in ECG measurement with relevant sketches.	**(10)**	**1**	**5**

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